U.S.S.N. 10,797,315

DRAWING AMENDMENTS

Please correct Figure 1 to replace item "24" identifying a line from the in-line mixing tank to "29" as indicated in the proposed replacement sheet.

Remarks

Thorough examination by the Examiner is noted and appreciated.

The drawings have been amended to be consistent with the Specification.

The claims have been amended and new claims added to clarify Applicants disclosed and claimed invention and to overcome Examiners rejections. The amendments find support in the original claims and/or the Specification.

No new matter has been added.

For example support for new limitations including new claims 21-25 are found in the original claims, Figures 1 and 2, as well as in the Specification at paragraph 0026:

"Pre-mixing mechanism 52 can thus be **implemented separately or together with pre-mixing tank 54 to form system 50.** System 50 provides **an innovative process capability with in-line and pre-mixing functions in one recipe.** System 50 can supply slurry to a varying CMP tools and is compatible with a variety of CMP processes (e.g., W, STI, ILD, Cu, etc). System 52 can be easily applied to mass production scenarios and operations, and can solve the slurry contamination problem caused by the use of central supply systems. System 52

can also provide a local supply system for every CMP machine or device currently in use in industry."

Claim Rejections under 35 USC 112

Claims 1, 4, 9, 14 and 19 have been amended to clarify Applicants disclosed and claimed invention thereby overcoming Examiners rejections under 35 USC 112, second paragraph.

CLAIM REJECTIONS UNDER 35 USC 102

Claims 1, 4-7, 9-11, 14-17, 19 and 20 stand rejected under 35 USC Section 102(e) as being anticipated by Kondo et al. (US 6, 709, 313).

Kondo et al. disclose a method and apparatus for mixing a slurry an water where a bypass fitted with a particle size detector is included at bypass points in a recirculation line in a slurry storage tank and in a slurry delivery line (see Abstract; Figure 1). Kondo et al. disclose a preparation tank (item 2, Figure 1) for mixing a slurry feedstock with pure water (col 5, lines 61-63) to adjust the concentration of the slurry

feedstock. Kondo et al. generally disclose that the preparation tank may include a meter for weighing the slurry feedstock or water, **or** an optical type, **or** conductivity type, **or** capacitance type measuring gauges for measuring the liquid amount. The diluted slurry is then fed to a slurry storage tank (see item 3, Figure 1; col 7, lines 22-27) including a recirculation loop prior to being delivered to CMP operations. Kondo et al. also disclose that a mixing tank (not shown) may be provided between the preparation tank and the storage tank (col 7, lines 38-47).

Thus Kondo et al. do not disclose or suggest several aspects of Applicants disclosed and claimed invention including:

Nowhere do Kondo et al. disclose **delivering or mixing a first and second slurry** as Applicants have disclosed and claimed.

Nowhere do Kondo et al. disclose **in-line mixing** as Applicants have disclosed and claimed.

Nowhere do Kondo et al. disclose **delivering the mixed slurry following mixing** as Applicants have disclosed and claimed.

Kondo et al. is clearly insufficient to anticipate Applicants disclosed and claimed invention.

Claim Rejections under 35 USC 103

1. Claims 2, 3, 12, and 13 stand rejected under 35 USC Section 102(e) as being unpatentable over Kondo et al., above, in view of Woo et al. (US 6,017,463).

Applicants reiterate the comments made above with respect to Kondo et al.

Woo et al., disclose an improved tungsten plug/local interconnect slurry for CMP operations where DI water is first added to a slurry followed by forming an oxidizer solution in DI water, followed by mixing the slurry and the oxidizer solution at the point of (simultaneous with) dispensing the slurry onto the polishing pad (see e.g., Abstract; col 3, lines 34-45; Figure 1).

Thus, the method of Woo et al. provides a pre-mixed batch of **slurry** and a pre-mixed batch of **additive** (oxidizer solution) where the oxidizer is added to the slurry **"as part of the flow onto the wafer"**. The method of Woo et al. is aimed at avoiding

corrosion of the CMP polisher (see e.g., col 3, lines 30-34).

There is no apparent motivation for combining the teachings of Kondo et al. with Woo et al. Kondo et al. teach that **additives are added to the slurry in the slurry storage tank** and the additive concentration is measured via a meter in the recirculation line (col 10, lines 39-56) prior to delivery to the CMP process. Woo et al. teach adding additives **simultaneously with delivery** onto the polishing pad with no provision for measuring the concentration of the additive. Thus, the methods of Kondo et al., work by a different principal of operation and the modification of either in an attempt to reconstruct Applicants disclosed and claimed invention would render both Kondo et al. and Woo et al. unsuitable for their intended operation.

Even assuming *arguendo*, a proper motivation for combining the teachings of Kondo et al., and Woo et al., such combination does not produce Applicants disclosed and claimed invention.

In particular Kondo et al., in combination with Woo et al. do not disclose or suggest a method or apparatus for **mixing a**

first slurry with a second slurry, and then delivering the mixed slurry to a CMP operation as Applicants have disclosed and claimed.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).*

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).*

2. Claims 8 and 19 stand rejected under 35 USC Section 103(a) as being unpatentable over Kondo et al., above, in view of Osterheld et al. (US 6,561,381).

Applicants reiterate the comments made above with respect to Kondo et al.

The fact that Osterheld et al. disclose the use of a load cell in a **slurry dispense module** for determining the rate of flow of the slurry to the CMP platen over time **by monitoring the change (decline) in weight** of the filled dispense module (see Abstract), does not further help Examiner in establishing a *prima facie* case of obviousness.

Even assuming *arguendo*, a proper motivation for combining the teachings of Kondo et al., and Osterheld, which work by different principals of operation, such combination does not produce Applicants disclosed and claimed invention including:

"measuring a weight of said first and second slurry according to at least one load cell comprising said pre-mixing tank"

as Applicants have disclosed and claimed.

"The fact that references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references." *Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).*

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

Based on the foregoing Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his

Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Tung & Associates

Randy W. Tung
Reg. No. 31,311
Telephone: (248) 540-4040